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# *Black Locust and How To Grow It*

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# BLACK LOCUST AND HOW TO GROW IT

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# BLACK LOCUST AND HOW TO GROW IT

## *INTRODUCTION*

Although forest planting in Idaho has been scant, for the most part a fairly good selection of species has been made. It is especially fortunate that among the trees chosen black locust (*Robinia pseudacacia*) has been given a prominent place. As a combination shelter, commercial, and ornamental tree, there is none that equals black locust for the treeless belts of the state. Others succeed in these belts, but this report is confined to this one tree. The greater portion of these treeless belts is far from timbered regions and farm owners here will find it to their advantage to grow a supply of wood at home.

It is especially desirable that more forest planting be done for commercial purposes. Most of the planting so far consists of narrow windbreaks, but if the windbreak be extended to woodlot proportions, but only will its protective and ornamental value be enhanced, but it will produce a large part of the timber supply needed on the farm such as fuel, fence posts, poles and farm repairs.

This report is based on field studies in which particular attention was given to the methods of planting, rate of growth, and yield of black locust woodlots and shelterbelts grown under irrigation in southern Idaho.

## *NATURAL RANGE*

Black locust is native to the slopes of the Appalachian Mountains from Pennsylvania to northern Georgia, and possible native to parts of Arkansas and eastern Oklahoma. It is nowhere common in its natural range, growing single or in small groups in mixture with other trees. This tree has been widely planted in the United States, especially east of the Rocky Mountains. It was introduced into the extreme west by the early settlers, where it has been a favorite, more particularly in Utah, southern Idaho, and eastern Washington and Oregon. It is, however, nowhere native to the west.

## *RANGE FOR PLANTING IN IDAHO*

The range of black locust for planting in Idaho includes all parts of the state, where the elevation is not over 4000 feet above sea level, and where the precipitation is not less than 15 inches. It occasionally succeeds at this elevation or below, where the precipitation is as low as 12 inches. Under irrigation, black locust succeeds anywhere in the state below elevations of 4000 feet, provided soil conditions are favorable. It is frequently found succeeding in sheltered places in elevations up to 4500 feet and in rare cases up to 5000 feet, but it cannot be recommended for commercial planting, such as woodlots and shelter belts in elevations above 4000 feet.

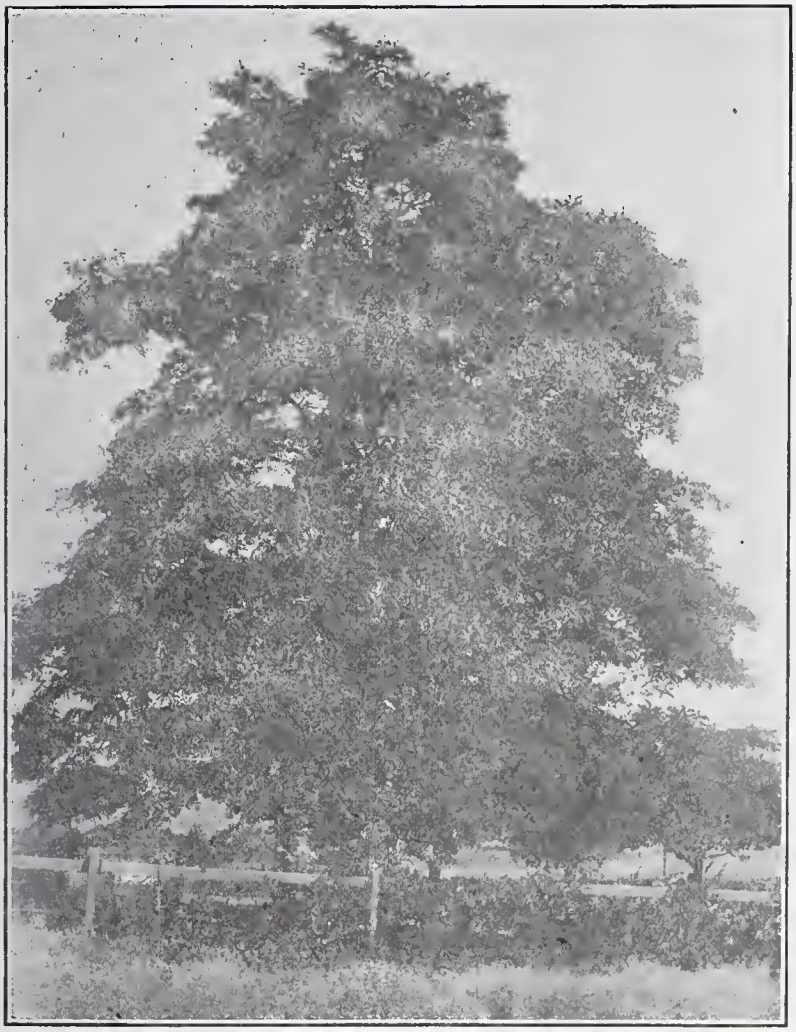
## *HABITS*

Black locust adapts itself to a wide range of soil conditions provided the site is not too wet tho it thrives best on rich well-drained loams. It is a tree that demands rather full light, and for this reason it cannot be expected to thrive under the shade of other trees. Although native to regions of abundant rainfall, it is surprisingly draught resistant in the dry belts of the west, especially after the first two or three years when once established.

In parts of Idaho, it sometimes freezes back the first two or three years, even in elevations below 4000 feet, but recovers, and when older it seldom winter kills seriously. Black locust grows rapidly, making in favorable situations a height growth of from two to four feet and a diameter growth of from one-third to one-half inch per year. Under irrigation, it will often materially exceed these figures, making fence posts in from 6 to 10 years.

The symmetrical form of black locust, its dark green foliage, which turns a pale yellow in late fall, together with its rich

growth of white flowers, appearing in June, make this tree highly useful for ornamental purposes.



**Black Locust**
The symmetrical form of black locust makes it highly useful for ornamental purposes.

## *ECONOMIC USES*

The wood of black locust is straight grained, strong, dense, hard, readily seasoned, holds its shape well, does not check, and is exceedingly durable in contact with the ground. It is used in bridge construction, the manufacture of vehicles and implements, in ship building, and for fence posts. It is one of the best woods known for use as tree nails, and is in great demand for

this purpose. More recently, black locust has come into demand for insulator pins, used in electric light and telephone construction. One manufacturer of insulator pins states that the planting of black locust in Idaho would yield in a few years a very lucrative crop, and adds, "You cannot impress it too firmly upon the minds of the farming community to raise black locust, as there will be a strong market for it". Owing to its great durability in contact with the soil, black locust is more generally used for fence posts than for any other purpose. The average life of locust posts is from 25 to 30 years. Farmers make constant use of black locust for farm repair materials, such as neck yokes, wagon tongues, double trees, reaches, etc.

## *HOW THE STUDY WAS MADE*

It is believed that the woodlots in Table 1 represent conservatively what may be expected in the way of fence post yields from the growing of black locust under irrigation in southern Idaho. Woodlots showing both lower and higher yields were estimated, but they were rejected because they were thought not to be normal. Yield estimates were based on sample plots representing average portions of the woodlot. These sample plots usually represented one-fourth or more of the woodlot, and never less than one-tenth of it. In many cases, the entire woodlot was estimated. All the trees on the sample plot were measured and classified into dominant, intermediate, and suppressed trees. The diameter of each tree was taken at 4½ feet and at 7½ feet from the ground, and the number of fence posts it contained was determined by ocular estimate. In computing the number of fence posts, a post was reckoned as 7 feet long in all cases. A stick measuring from 2 inches to 2.9 inches at the small end was classed as a third class post, from 3 inches to 3.9 inches as a second class post from 4 inches to 5.9 inches a first class post, from 6 inches to 7.9 inches as two-first class posts, from 8 inches to 9.9 inches as three first class posts, and from 10 inches to 12 inches as four first class posts. These specifications will run considerably higher than those in actual use.

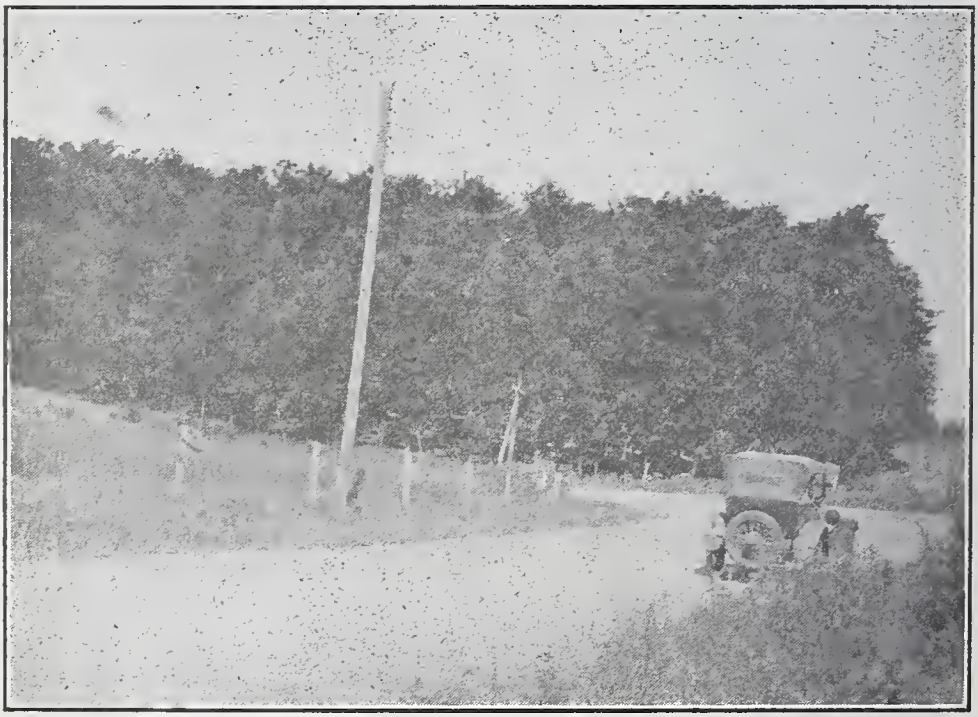
In calculating the money yields of the various woodlots, a first class post is assigned a value of 40 cents, a second class 25 cents, and a third class 10 cents. These are stumpage prices and are based on prices prevailing in the region as determined after extensive inquiry. In fact they are considerably below

## TABLE 1

Showing the location, age, area, diameter and height of the dominant trees and the yield and value in terms of fence posts of seventeen typical woodlots studied.

| Woodlot Number | County | Years Old | Area Acres | Original Spacing Feet | Number of Trees per Acre Now | Average size of Dominant Trees | | Yield of Posts Per Acre | | | | Value of Posts Per Acre | | Yield of Posts Per Acre Per Year | | | | Annual Income Per acre at 5 per cent Compound Interest | Woodlot Number |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Dia. at 4½ ft. from gr. | Height Feet | First Class | Second Class | Third Class | Total | Gross | Net | First Class | Second Class | Third Class | Total | | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) | (19) | |
| 1 | Canyon | 7 | 3.21 | 8x7 | 405 | 3.9 | 43 | 173 | 500 | 510 | 1183 | 245.20 | 219.87 | 25 | 71 | 73 | 169 | $ 27.00 | 1 |
| 2 | Canyon | 9 | 3.21 | 8x8 | 438 | 4.8 | 45 | 450 | 504 | 634 | 1588 | 369.40 | 341.47 | 50 | 56 | 70 | 176 | 30.97 | 2 |
| 3 | Canyon | *9 | 3.25 | 6x5 | 726 | 4.7 | 44 | 560 | 714 | 879 | 2153 | 490.40 | 462.48 | 62 | 79 | 98 | 239 | 41.94 | 3 |
| 4 | Canyon | *9 | 1.12 | 6x5 | 943 | 4.2 | 45 | 591 | 653 | 908 | 2152 | 490.45 | 462.53 | 66 | 74 | 101 | 241 | 41.95 | 4 |
| 5 | Twin Falls | 9 | 2.06 | 4x4 | 838 | 3.8 | 34 | 327 | 584 | 755 | 1666 | 352.30 | 324.38 | 36 | 65 | 84 | 185 | 29.42 | 5 |
| 6 | Canyon | 11 | 1.08 | 8x2 | 944 | 3.4 | 43 | 268 | 728 | 1092 | 2088 | 398.40 | 367.61 | 24 | 66 | 99 | 189 | 35.88 | 6 |
| 7 | Canyon | 13 | 1.41 | 6x5 | 764 | 5.6 | 53 | 1359 | 632 | 1200 | 3191 | 821.60 | 786.66 | 104 | 49 | 92 | 245 | 44.41 | 7 |
| 8 | Canyon | 13 | .78 | 6x4 | 976 | 4.3 | 44 | 608 | 792 | 984 | 2384 | 539.60 | 504.66 | 47 | 61 | 76 | 184 | 28.49 | 8 |
| 9 | Canyon | 14 | .95 | 7x4 | 697 | 5.8 | 58 | 1179 | 785 | 654 | 2618 | 733.25 | 697.61 | 84 | 56 | 47 | 187 | 35.59 | 9 |
| 10 | Canyon | 14 | .88 | 6x4 | 925 | 5.3 | 49 | 1132 | 809 | 994 | 2935 | 754.45 | 718.81 | 81 | 58 | 71 | 210 | 36.68 | 10 |
| 11 | Canyon | 14 | .45 | 4x6 | 477 | 6.6 | 59 | 1276 | 454 | 311 | 2041 | 655.00 | 619.36 | 91 | 32 | 22 | 145 | 31.60 | 11 |
| 12 | Ada | 14 | .26 | — | 1004 | 5.2 | — | 1337 | 636 | 947 | 2920 | 788.50 | 752.86 | 95 | 45 | 68 | 208 | 38.41 | 12 |
| 13 | Gooding | 14 | .35 | 3½x4 | 954 | 4.8 | 38 | 829 | 752 | 1047 | 2628 | 624.30 | 588.70 | 64 | 58 | 81 | 203 | 30.04 | 13 |
| 14 | Twin Falls | 14 | .67 | 5x2 | 1419 | 3.6 | 37 | 358 | 835 | 1506 | 2699 | 502.55 | 466.91 | 26 | 60 | 108 | 194 | 23.82 | 14 |
| 15 | Twin Falls | 15 | 4.76 | 10x5 | 519 | 4.8 | 53 | 517 | 494 | 505 | 1516 | 380.80 | 343.38 | 34 | 33 | 34 | 101 | 15.92 | 15 |
| 16 | Twin Falls | 18 | 2.00 | 5½x4½ | 745 | 6.2 | 72 | 1782 | 754 | 754 | 3290 | 976.75 | 933.43 | 111 | 47 | 47 | 205 | 33.18 | 16 |
| 17 | Canyon | 20 | .40 | 8x7 | 518 | 7.5 | 50 | 1815 | 582 | 612 | 3009 | 932.70 | 844.94 | 91 | 29 | 31 | 151 | 26.76 | 17 |
| | Average | 12.9 | 1.58 | — | 782 | 4.96 | 48 | 856 | 659 | 841 | 2357 | 591.50 | 557.39 | 64 | 55 | 71 | 190 | 31.88 | |
| | *Sprouts | | | | | | | | | | | | | | | | | | |

Interior View of Woodlot No. 9, Table 1. This woodlot had a yield per acre of 1179 first class posts, 785 second class posts and 654 third class posts, a total of 2618 posts when 14 years old, giving an annual yield of 187 posts per acre.



Exterior View of Woodlot No. 9, Table 1.

prices obtained in certain localities. At one ranch, posts 6.5 feet long averaging 5.7 inches in diameter at the small end were selling at $1.00 each for corner posts. At another 8 foot posts which averaged 5.2 inches at the small end were selling for $1.00 apiece. On this same ranch, second class posts were bringing 35 cents apiece, and third class posts 15 cents.

## HOW THE ANNUAL INCOME PER ACRE WAS DETERMINED

The gross value in column 13 of Table 1 is found by applying the above prices to the number of posts in each class and adding the results. For example, in woodlot No. 9, 1179 posts at 40c, 785 at 25c, and 654 at 10c amounts to $733.25. The cost of establishing a black locust woodlot is reckoned at $18.00 per acre. The cost would probably run somewhat higher now, but the $18.00 would cover the cost at the time the woodlots in question were planted. The net value of each woodlot as shown in column 14 was found by calculating the amount of $18.00 at 5 per cent compound interest for the age of the woodlot, then deducting this amount from the gross value per acre as determined by applying the above prices. Using woodlot No. 9 as an example again, the cost of $18.00 at 5 per cent compound interest for 14 years amounts to $35.64. Substracting $35.64 from the gross value of $733.25, column 13, gives the net value of $697.61 in column 14. This net value was then converted into an annual income per acre at 5 per cent compound interest as shown in column 19. This annual income is the sum which, if paid in each successive year from the year of planting during the life of the woodlot, would at 5 per cent compound interest now amount to the net value per acre, as given in column 14. For example, the annual income per acre of woodlot No. 9 is $35.59 as given in column 19 and the age of this woodlot is 14 years. If the $35.59 is simply paid fourteen times, and the payments do not draw interest, the amount is $35.59 times 14 or $498.26. But if the first payment of $35.59 draws compound interest at 5 per cent for 14 years, the second payment for 13 years, the third for 12 years, etc., the amount is $697.61 as shown in column 14.

This method of showing the annual income makes it possible to compare the annual income from woodlots with the annual income received from farm crops or with a cash rental basis. Taxes and water rents are omitted because these expenses would be about the same regardless of the crop.

## *WHAT THE TABLE SHOWS*

From a study of the averages, it will be seen that the average age of the seventeen woodlots included in the table is 12.9 years, and that the average annual income per acre at 5 per cent compound interest is $31.88 (Column 19). In other words, if this average acre had been farmed the past 13 years, it would have had to yield an average annual income of $31.88 to equal the income from the average acre of these woodlots. Or again, this income is the same as a cash rental of $31.88 per year, the owner of the land to pay the taxes and water rent.

It should be kept in mind that this average acre represents poorer land than does the average acre in field crops on these same farms and has probably received much less care. Moreover, the data entering into this average acre were collected after more or less cutting had been done. For example, in woodlot No. 1 a stump count shows that 5 per cent of the trees had been cut before this study was made. Nearly 6 per cent had been cut from No. 3, 61 per cent from No. 11, 11 per cent from No. 14, 9 per cent from No. 16, and 13 per cent from No. 17.

Several occupy land that is too sandy, too rocky, or for some other reason is off-color for field crops. Numbers 2, 3, 4, 6, and 7 are all on sandy soil. No. 9 is on hard pan, and No. 15 is on soil that is both thin and rocky.

The table shows that under the conditions obtaining for these 17 woodlots the average acre produces in 13 years 190 posts annually of which 34 per cent is first class posts, 29 per cent second class, and 37 per cent third class. It will be noted that several woodlots exceed these figures.

No. 7 is the most profitable of the 17, the annual income being $44.41. It will be noted that it is 13 years old, and has produced an annual average of 245 posts. The real value, however, lies in the fact that 104 of these, or 42 per cent, are first class posts. This woodlot is on sandy soil, and was planted to black locust, because the surface soil was too unstable to produce field crops, as the wind would uncover the grain so that it would not germinate. Moreover, the wind would level the embankments of the irrigation laterals, thus releasing the water to escape broadcast. Seeing that for these reasons the land was unprofitable in field crops, the owner planted it to black locust and it is doubtful whether his rich loam land in field crops has paid him as well.

Woodlots 3 and 4 are from sprouts. They were planted in

the spring of 1909 and were harvested in the winter of 1914-1915, or after they had made their sixth year's growth. The material found a ready sale for wagon tongues, braces, and coupling poles in 13 foot lengths at 25c, and for posts at from 3c to 8c, or for corner posts at from 75c to $1.00. The stumps sent up a vigorous crop of sprouts in the summer of 1915. It will be noted how strikingly similar are the annual yields on these two woodlots in both posts and money. Some cutting as has been noted had been done in No. 3, but none in No. 4 . No 3 contains 726 trees per acre, and No. 4, 943, but the average dominant tree in No. 3 is 4.7 inches in diameter at 4½ feet from the ground, and 4.2 inches in No. 4, hence No. 3 would cut out more first class posts per tree than No. 4. Both woodlots occupy a very sandy soil, on which field crops proved a failure.

Woodlot No. 15, it will be noted, gives the lowest yields of the entire 17. This is accounted for from the fact that it occupies in part a thin, rocky soil, and it has been heavily pastured. It is also believed that the spacing of 10 feet between the rows is too wide for the best yields in fence posts, as the trees have a tendency to branch close to the ground, a defect which close spacing between the rows would have prevented.

The table also shows strikingly the mistake of cutting the stand when it is too young, as the older trees furnish the greater percentage of high class posts. For example, column 15 shows the yield of first class posts per year to be 24 per cent of the total for woodlots 9 years old and under, while for those older than 9 years the per cent of first class posts is 38. Comparing No. 1, the youngest 7 years old, with No. 17, the oldest 20 years old the percentages of first class posts produced annually are 15 and 60 respectively. Since the profit is in the high class material, obviously to enjoy the greatest profits the trees must be allowed to stand long enough to enable them to produce high class stuff. Data at hand are too meager to show just what is the most profitable age to harvest, but the data here presented would indicate that this age is above 20 years. Meanwhile, of course, the woodlot would have supplied a large quantity of posts in the way of judicious thinning.

It should be borne in mind that the first 5 or 6 years produce very little in the way of first and second class posts, but every year after that the annual returns progressively increase up to a certain age not yet determined.

## *CULTURAL METHODS*

### *Planting Stock*

In establishing a woodlot or shelterbelt of black locust, the use of one year old seedlings is advisable. Such stock will run from 18 to 24 inches in height, a desirable size for planting. The stock may be purchased at about one-half cost from the School of Forestry, or from nurserymen at reasonable prices, Names of reliable firms will be furnished on application.

One-half million black locust seedlings growing in the Forest School Nursery.

### *How to Grow Black Locust from Seed*

Black Locust is easily propagated from seed and parties wishing to grow their own stock can readily do so.

Select a well drained gentle slope, preferably with a northerly or easterly exposure, and prepare the ground as you would if you were to use it for a garden. The best soil for the purpose is a sandy loam, though any good pliable soil will do.

Lay the ground off in rows 30 inches apart and drill the seed in rows. The seed should be rather thick in the row, since probably not over 50 per cent of it will grow, and not all of this will produce suitable plants.

The depth and covering of the seed are both very important. No certain depth can be stated that will apply in all conditions. The seeds must be deep enough to make sure that the wind does not dry the soil out about them, and yet not so deep that they cannot get through. Around 2 to 3 inches is usually about right. After the seeds are drilled in, the soil should be firmed (not packed) on the *sides* of the drill row, but not on the *top,* as the soil on the top should be left loose so that the sprouts can readily come up through it. The latter part of April, or even the first part of May is a good time to plant the seed.

The ground should be kept thoroughly cultivated throughout the summer, but do not use too much water, as this will stimulate too rapid growth, and the stock will not be so hardy as if it grew more slowly. In any case, stop the irrigation by the middle of August so as to slow down the growth and allow the young trees to harden up for winter.

It may be of interest in ordering seed to know that a pound of black locust contains about 26,000 individual seeds. Often the seed may be gathered locally.

*Time to Plant Seedlings.*

Spring planting of seedlings is advised in preference to fall planting and as early as the soil may be readily tilled. The earlier the better after the ground is in shape. It is important that the ground first be put in a thorough state of cultivation as the young trees should be given every advantage possible at the start.

*How to Handle the Stock*

Immediately on the arrival of the trees at the railroad station they should be taken to the farm, and if possible, planted the same day. If necessary to hold them over, they should be unpacked and heeled-in. This is done by digging a trench of suitable length, say six feet, and deep enough to take in the roots of the seedlings full length. One side of the trench should be slightly sloping. Against this sloping side place a layer of trees roots down, and bank with earth to a level with the surface. This layer of earth should be about two inches thick, well packed and the outside left somewhat sloping, against which place the next layer of trees, repeating the operation till all are heeled-in. The soil should be moist and pliable, but not wet, and the work must be carefully done.

*Spacing*

In establishing a woodlot of black locust in Idaho on non-

irrigated land, where the annual precipitation is 15 inches or more (if less black locust is not advised) a spacing of 8 by 8 feet is recommended. Under irrigation, the spacing recommended is 6 by 6 feet. This is a conclusion reached by the writer after a careful study of the matter of spacing in a large number of irrigated woodlots of black locust, exhibiting all combinations of spacing from 2 by 2 feet to 8 by 8 feet, and representing all ages from 2 years up to 30 years. These studies indicate quite conclusively that the spacing should not be closer than 6 by 6 feet. It may be that a somewhat wider spacing, say 7 by 7 feet would be satisfactory, but the data at hand quite conclusively show that there is no advantage in a wider spacing than 8 feet by 8 feet.

The studies indicate that the practice of giving the trees a wider spacing one way than is given them the other, for example, 2 by 6 feet, 4 by 8 feet, or any other irregular spacing, cannot be recommended, as the trees in their struggle for light and space will then bend to one side or the other and are therefore not so straight as when crowded equally on all sides and forced to grow straight up. This was strikingly shown in the study of woodlot No. 6 where the spacing is 8 by 2 feet, and it was noted that a high percentage of the trees was small and crowded to one side in the row, and gave lower yields than would have resulted had the spacing been more normal.

If the trees are closer than 6 by 6 feet, they soon fight for space and become stunted, and if wider than 8 by 8 feet the ground is not fully utilized for some years, and meanwhile there is a tendency for the trees to grow branchy.

For the information of the reader, it may be added that a spacing of 6 by 6 feet requires 1210 trees to the acre, 7 by 7 feet 889 trees, and 8 by 8 feet 680 trees.

*How to Plant*

In planting, the holes should be deep enough so that when the trees are set in place they will stand a little deeper than they stood in the nursery row. When setting the tree, the roots should be spread out as nearly as possible in their natural position. Use the hands in replacing the first few layers of dirt, and see that it is pressed, carefully and firmly about the roots. The trees should be planted in straight rows both ways to facilitate cultivation.

The ingenious planter will readily devise ways and means of doing the actual planting that will best suit his conditions. If

only a few hundred trees are to be planted one man may do the work advantageously. If the plantation is to contain several thousand trees, an advantageous planting crew may consist of two men and a boy--the two men provided with spades to do the planting, working side by side, and the boy carrying the trees in a pail, partly filled with water, hands them to the planters as they are needed. Great care should be taken not to allow the roots of the trees to become dry, as a few minutes exposure to the sun and wind may kill them.

*Care and Cultivation*

The woodlot should be given clean tillage as long as practicable. This is especially important the first two or three years. With the trees 6 feet apart each way, horse cultivation will be possible for at least the first two years. Three cultivations a season, one after each irrigation, are sufficient. Cultivate both ways, after each irrigation so as to keep the ground level. When the trees occupy the ground sufficiently to preclude cultivation, they will be sufficiently established to take care of themselves without further cultivation.

Livestock of all kinds must be rigidly excluded for the first several years, and if kept out entirely, the woodlot will be more successful. It is appreciated, however, that the shade in summer and shelter in winter the trees will afford livestock are very desirable, and these factors may largely offset the damage to the trees. Moreover, the woodlot will furnish some forage. But in any case livestock should not have the run of the woodlot for the first 5 or 6 years, and then only sparingly. Mr. F. A. Powers at Parma (owner of woodlot No. 9) did not pasture his woodlot with any kind of stock for the first seven years. The eighth year he turned in a few head of cattle, and a few head of sheep a year or so later.

Mr. F. W. Hastings, Wendell, Idaho, has made the suggestion that instead of using as valuable a woodlot as one of black locust as a stock yard, one of less valuable trees, such as cottonwood, be planted especially for this purpose.

*Irrigation*

Ordinarily three irrigations each season, if properly timed and thoroughly done, will be sufficient. In any event, water should be entirely taken off not later than August 15, in order to arrest the growth of the trees and give the newly formed wood a chance to ripen up before freezing weather sets in. This is very important, for if water is applied after August 15, the

trees keep on growing and enter the winter season with a growth of succulent, unhardened material that is readily injured by freezing weather. Late watering is one of the chief causes of winter killing.

Permanent corrugations may be made when further cultivation is no longer practicable. Three corrugations between each pair of rows will be sufficient.

*Cutting Back*

In order to secure straight stems for fence posts, double headed or crooked trees should be cut back to the ground at the end of the first, second, or even third growing season. The stump will send up a strong vigorous shoot the season following, which in a few years will be as large as the other trees of the stand not so treated. If more than one sprout starts from a given stump, all but the most promising should be pruned off in August of the first season.

*Pruning*

Better fence post stock is secured if more or less artificial pruning is given the trees when three to five years old. This should be done with a sharp instrument, and using an upward stroke, each limb should be cut off close to the body of the main stem. The upward stroke leaves a smoother wound than a downward stroke.

*Protection Against Fire*

Not an uncommon source of fire is the accumulation of tumble weeds and other inflamable material around the borders of the woodlot. As a precaution against fire, the woodlot should be kept free from all such material.

*Thinning*

When planting trees 6 by 6 feet, or at the rate of 1210 trees per acre, it is inevitable that some of them will become suppressed, crooked, or otherwise undesirable. Such trees should be removed by judicious thinning as they will not make desirable stock and at the same time are taking up plant foods that had better go to the more promising trees. In any event, the material thinned out will make fuel, and some of it may be large enough for third class posts.

## *HOW TO HARVEST THE CROP*

Aside from whatever thinning that may be desirable, it is recommended that clear cutting be the practice in harvesting the

crop. This does not mean that the entire woodlot should be harvested at the same time. It may be cut in small units, cutting a unit each of sufficient size to supply the amount of material required. Whatever the size of the unit, however, all the trees on it, good, bad, and indifferent, should be cut at the same time, rather than to select trees here and there to cut. The stumps will then send up a new crop of sprouts the following spring. There will, however, be vacancies in the original stand because on account of artificial thinning, or due to loss from natural causes, not all the trees planted will survive till the time of harvesting. The vacant spots resulting should be replanted with one year old seedlings the following spring. The seedlings and the new sprout growth will start at the same time, and the area will again be fully stocked.

The reason for clear cutting is that black locust is a very intolerant tree; that is, it will not thrive in shade. If trees are cut here and there, the sprouts from the stumps, if they start at all will not survive under the shade of the remaining stand. But when a block is cut of sufficient size to let the sunlight in, a new crop from sprouts is reproduced at once.

If the cutting is rightly managed, after it is once begun, a certain amount of material may be cut each year from then on for an indefinite period. For example, a woodlot of black locust grown under irrigation and well cared for may be expected, when ten years old, to yield not less than 2000 posts per acre or 200 per acre annually. If cutting is begun when the woodlot is 10 years old, and one-tenth of it is cut each successive year for 10 years, and each block is allowed to reproduce a new crop from the stumps, and the vacant spots planted up the next spring after being cut as has been suggested, then 200 posts per acre may be cut each year indefinitely, except that during the first ten year cutting period, the yield would increase from year to year after cutting starts, since the blocks would vary in age from 10 to 20 years when actually cut. When the last block of the original crop is cut, which will be when it is 20 years old, the first block cut will be 10 years old—hence ready to cut again. When a farmer once determines his annual requirements in terms of posts, he can then readily know how large a woodlot he must plant in order to supply his needs.

## *PLANTING ALONG THE HIGHWAY OR DITCH BANK*

Not only is black locust profitable when grown in the form of woodlots, but when grown along highways and irrigation later-

als as well. For example, a row of 42 trees, 12 years old, planted 8½ feet apart along an irrigation lateral in Canyon County was estimated to contain 153 first class posts, 49 second class posts, and 50 third class posts. The trees were planted 10 feet from the lateral, tho they could just as well have been 5 feet from it, thus reducing the ground occupied by them to a minimum. It was noted that livestock had made very free use of this row of trees in winter for shelter.

On this same farm, a row of 50 trees of black locust, 14 years old, planted 8 feet apart, stood along a highway, running east and west, and within a few feet of an irrigation lateral. This row would yield 252 first class, 51 second class, and 44 third class posts.

A two-row windbreak consisting of 120 black locust, in Jerome County is planted one row on either side of an irrigation lateral, at the water's edge. The windbreak is 375 feet long. It is 10 years old, and would cut 230 first class, 108 second class, and 144 third class posts. There is a road leading from the barn to the field along the north side of this windbreak, and since this road is necessary, there is very little extra loss of ground on account of the windbreak. In general planting along highways and irrigation laterals is very economical in the use of ground, since there is always more or less waste of space along such places.

One of the most striking examples of profitable windbreak planting is found on the farm of Marion Hammons, near Twin Falls, in Twin Falls County. It consists of a single row of black locust on the east, north, and west sides of a 40 acre farm. The trees were planted in 1906, and were making their 18th year's growth when measured. The trees average 5.3 feet apart. Those on the east and north sides of the 40 acres were planted between two laterals, and along a single lateral on the west side. The trees 16 years old when measured were 40 to 50 feet high and averaged 5.4 inches in diameter at 4½ feet from the ground. The rows are not quite full on all three sides, hence the actual planting consists of 220 rods. These 220 rods were estimated to contain 2310 first class posts, 1012 second class, and 968 third class. Fire at three different times escaped into the windbreak, doing more or less damage, and considerable cutting had been done before this estimate was made, 100 large poles used in the construction of a potato cellar being cut at one time.

**Black Locust along the roadside near Grand View, Idaho**

As showing the value of the planting as a windbreak, the owner cites the fact that in one windstorm which occurred September 19, 1920, it saved him $200 worth of apples. He judged the amount of this saving by the loss from windfalls in neighboring orchards, unprotected during the same storm. The wind came almost directly from the west, and the orchard is situated to the east of the one-row black locust windbreak on the west side of the farm. The orchard is 580 feet north and south and 640 feet east and west, thus containing about 8½ acres.

It was noted that wheat, alfalfa, and potatoes suffered very little injury from the presence of the Hammons' windbreak. Beets and corn on the west of the north and south rows would give only a light yield on a strip 12 to 15 feet wide adjacent to the trees. Since the irrigation laterals entail some waste in the use of the land, the slight additional loss from the presence of the windbreak along them is doubtless more than offset by the protection afforded the crops, not to mention the value of the material in the windbreaks for posts, poles and farm repairs.